

**Chapel Hill-Carrboro Meals on Wheels Community Outreach Project:  
An Exploratory Study on the Growing Asian Senior Population's Awareness of CHCMOW and  
the Need to Receive Its Service**

Kate Chou

The University of North Carolina at Chapel Hill

Gillings School of Global Public Health

A paper submitted to the faculty of the University of North Carolina at Chapel Hill in partial fulfillment of  
the requirements for the degree of Master of Public Health in the Department of Nutrition

Date

Approved by: Amanda Holliday  
(Paper Advisor)  
Date: 12/1/19

### **Acknowledgments**

I want to thank all the participants at the Seymour Center, who spent the time completing the survey and also shared their life experiences with this project. I also appreciate CHCMOW Executive Director Rachel Bearman, UNC MPH/RD Program Director Amanda Holliday, Orange County Department on Aging Eldercare Services Administrator Annie Deaver, Volunteer Connect 55+ Administrator Shenae McPherson and Community Liaison and Program Coordinator Hong Zhou to support this project. Also, I am grateful for CHCMOW Volunteer Coordinator Heather Harris, Orange County Rural Alliance President Norma White, and Orange Congregations in Mission Emily Corley, who coordinated the shared rides for me to shadow their meal delivery services. Finally, I would also like to thank the quantitative and qualitative consultants from The Odum Institute at UNC to assist in providing suggestions in my survey design and data analysis.

## BACKGROUND

The world is aging! In the future 30 years, the older population aged 65 or over will increase from 9% in 2019 to 16% in 2050 (United Nations, Department of Economic and Social Affairs, Population Division, 2019). In 2035, it will be the first time that the older population aged 65 or over will be higher than children under 18 in the United States (United States Census Bureau, 2018). North Carolina ranks 9<sup>th</sup> in total population and the number of people aged 65 or over. In 2019, North Carolina is estimated to have more population aged 60 or over than the population under 18 years old (NC DHHS, Division of Aging and Adult Services, 2019). In Orange County, the older population aged 60 or over will increase by 60% compared to 50% in NC from 2017 to 2037.

In terms of the growth in different racial groups, Asians are the fastest growing population in the United States. In North Carolina, the Asian population is growing at a faster pace than the nation. Based on American Community Survey (ACS) 2017 5-year estimates data, the Asian population in North Carolina has increased by 33% versus 19% in the United States compared to ACS 2011 5-year estimates data (U.S. Census Bureau, 2012, 2019). Orange County ranked the top 5 of the highest Asian population in North Carolina, which makes up 7.7% of the county population, and the Chinese share 38.5% of the Asian population. In Chapel Hill, Asians are also the fastest growing population, which has increased by 19% compared ACS 2017 to ACS 2011 5-years estimates (U.S. Census Bureau, 2012, 2019). Regarding Asian seniors aged 65 or over in Chapel Hill, there are 486 Asian seniors, who have increased by 463% compared ACS 2017 to ACS 2011 5-years estimates. Looking at the census tract data, most of the Asian seniors live around the center of Chapel Hill Township (see Appendix I).

Older adults are at increased risk of malnutrition, especially among those who are economically disadvantaged, socially isolated, or disabled (Wright, Vance, Sudduth, & Epps, 2015). Epidemiological studies found that food insecurity is associated with a large and growing number of health conditions, including obesity (Cheung et al., 2015; Wright et al., 2015), diabetes (Fitzgerald, Hromi-Fiedler, Segura-Pérez, & Pérez-Escamilla, 2011; Seligman, Bindman, Vittinghoff, Kanaya, & Kushel, 2007), hypertension (Irving, Njai, & Siegel, 2014), depression and serious mental illness (Leung, Epel, Willett, Rimm, & Laraia, 2015; Mangurian, Sreshta, & Seligman, 2013), and poor dietary intake (Hanson & Connor, 2014), etc., which generate higher health care costs among older adults. Disease-associated malnutrition in older adults is estimated at \$ 51.3 billion annual costs in the US (Snider et al., 2014). In NC, 10.5% of the total senior population are food insecure, and in Orange County, nearly 1 in 8 people suffer from food insecure.

Meals on Wheels (MOW) America is the leading organization that supports the country-wide over 5,000 community-based programs designed specifically to meet the nutritional and social needs of seniors to addresses senior hunger and isolation (Meals on Wheels America, n.d.). MOW's mission is not just delivering a meal, but they provide social interaction along with frequent in-home visits. Their services provide important opportunities to combat social isolation and address safety hazards. Orange County has three home-delivered meals agencies: Chapel Hill-Carrboro Meals on Wheels (CHCMOW), Orange County Rural Alliance (OCRA) and Orange Congregations in Mission (OCIM).

Orange County Department on Aging creates a Master Aging Plan every five years to provide comprehensive and coordinated delivery of community services to support community engagement and older adults' overall well-being (Blomberg et al., 2017). In the current 2017-2022 Master Aging Plan, one of the goals is to increase awareness of food services, such as Meals on Wheels, for older adults. Therefore, this project tends to address this goal by selecting the Asian seniors, one of the underserved populations, to understand their awareness and the need to receive CHCMOW service. Besides this goal, the Asian seniors were also selected due to the lack of secondary data about this Asian senior population's awareness of CHCMOW. Furthermore, the Asian senior population is the second-largest minority group after African American older adults and has had the fastest growth in Orange County. The research questions in this project include:

1. How well do these Asian seniors know about CHCMOW?
2. What is the Asian seniors' health and nutritional status?
3. Is there a need for these Asian seniors to receive CHCMOW service?

#### **STATEMENT**

*"CHCMOW serves older adults, homebound adults and those convalescing in Chapel Hill, Carrboro, and southern Orange County, who do not have access to, or the ability to prepare healthy meals. People of all incomes may be eligible. CHCMOW does not discriminate on the basis of race, religion, creed, color, gender, sexual orientation, disability, or national origin."*

--- CHCMOW

# METHODS

## **Study Design and Procedure**

To explore this understudied Asian senior population, the combination of both quantitative and qualitative methods was most appropriate.

### *Quantitative research*

A paper form survey was designed to test seniors' awareness and perceptions of CHCMOW and also to collect demographic information and some potential predictors of nutritional risk such as age, gender, race/ethnicity, education, marital status, and health issues (Appendix II). In addition, the NSI DETERMINE checklist was used to assess older adults' nutritional status (Appendix III). The cumulative score is classified into three categories of nutritional status: a score of 6 and higher for persons at high nutritional risk, a score of 3 to 5 for persons at moderate nutritional risk, and a score of 0 to 2 for persons at no or low nutritional risk. Both were conducted during Malnutrition Awareness Week at Seymour Center, and the participants were selected by convenience sampling. Both tools have English, Spanish and Chinese versions. At the end of the survey, I provided nutritional education, which was tailored to their health problems, nutritional handouts, and I also referred malnourished seniors to food assistance programs, like meals on wheels.

### *Qualitative research*

A descriptive qualitative study was used in this project with semi-structured interviews. Individual in-depth interviews and key informant interviews were conducted within two weeks after the Malnutrition Awareness Week. The qualifying criteria for individual in-depth interview participants are as followed (1) self-identified as an Asian (2) Chinese speaker (3) Orange County resident. The key informants are either staff at the Seymour Center or volunteers, who are familiar with these Asian Seniors. The interviews were conducted by me, who speak Chinese and also identified as an Asian (Taiwanese). The recruitment was based on the trust relationship established between the community and me. The interview questions were designed by modifying the focus group questions from Orange County Master Aging Plan (Blomberg et al., 2017) and other similar studies (Knight & Ricciardelli, 2003). The questions are related to their awareness and perceptions of CHCMOW, meal preparation, health and nutrition conditions, acceptance of CHCMOW, and other interested topics, such as their aging experience in the United States. Before starting the interview, I got permission from all the participants to record the conversations to transcribe for data analysis.

Both the survey and interview questions were approved by CHCMOW and also Orange County Department on Aging.

## **Data Analysis**

### *Quantitative Data*

The surveys were collected, and the data was entered in Qualtrics. Finally, the survey data was evaluated using RStudio for data analysis. The predicted probability of being aware of CHCMOW among the Asian seniors was estimated using logistic regression. The relationship of the NSI score between Asian and non-Asian seniors was estimated using linear regression. The association of nutritional risk score among potential variables (race, age, gender, education level, marital status, and living arrangement) was individually analyzed by using Fisher's exact test. The statistical significance was set at  $p < 0.05$ .

#### *Qualitative Data*

Interview contents were transcribed and translated in English. The transcriptions were then coded in "awareness of CHCMOW," "perceptions of CHCMOW," "meal preparation," "social contact," and "acceptance of CHCMOW." Data analysis was carried out with the use of ATLAS.ti.

# RESULTS

## Survey

One hundred surveys were collected during the Malnutrition Awareness Week. Among the respondents, 22 are Caucasians, 8 are African Americans, 45 are Asians, 15 are Hispanic or Latino or Spanish Origin, 4 reported two or more race/ethnicity, 5 reported others (Nicaragua, Irish-Scot, Human, and Italian descent), and 1 didn't her report race/ethnicity.

The survey results are divided into six sections as the following:

### *Asian Seniors' Background*

Table 1 shows the Asian seniors' characteristics. 80% of them are from China, while others are from Taiwan, Thailand, Hong Kong, Indonesia, India and Japan. 27% of them are at age 65-69, followed by 70-74 and 75-79, and one senior didn't report age. 69% of them are females, and 31% are male. 31% of them reported their education level as less than high school graduate followed by some college or associate's degree and bachelor's degree. 89% of their primary language are Chinese, and 61% of their English level are less than very well. 96% of Asian seniors live in Orange County, and 93% of them live in Chapel Hill Township. 82% stated living with family. 64% reported married, and 27% are widowed.

### *Awareness of CHCMOW*

10 out of 45 (22%) Asian seniors have never heard of CHCMOW, while 63% of non-Asian seniors have heard of it. Being an Asian senior in this project had 0.35 times the probability of being aware of CHCMOW compared to non-Asian seniors which is statistically significant ( $p=0.04$ ). For those who have heard of CHCMOW, 3 reported they heard it from friends, followed by neighbors, social media, the senior center and the CHCMOW brochure.

### *Perceptions of CHCMOW*

For those who have heard of CHCMOW, they were led to the questions testing their perceptions of the CHCMOW service. 2 seniors think there is an age requirement to receive CHCMOW service, who both reported 60 is the minimum age,

**Table 1. Characteristics of Asian Seniors**

	n (%)
<b>Origin Country</b>	
Chinese	36 (80%)
Taiwan	4 (9%)
Hong Kong	1 (2%)
Indian	1 (2%)
Indonesia	1 (2%)
Japan	1 (2%)
Thailand	1 (2%)
<b>Age</b>	
Under 55	1 (2%)
55-59	1 (2%)
60-64	5 (11%)
65-69	12 (27%)
70-74	10 (22%)
75-79	9 (20%)
80-84	5 (11%)
Above 85	1 (2%)
No specified	1 (2%)
<b>Gender</b>	
Male	14 (31%)
Female	31 (69%)
<b>Education level</b>	
Less than high school graduate	14 (31%)
High school graduate or equivalent	4 (10%)
Some college or associate's degree	10 (22%)
Bachelor's degree	10 (22%)
Graduate or professional degree	7 (16%)
<b>Primary language at home</b>	
Chinese	40 (89%)
English	3 (7%)
Other language	2 (4%)
<b>English level</b>	
Very well	6 (15%)
Fairly well	5 (13%)
Only a little	4 (10%)
Not at all	15 (38%)
No specified	10 (25%)
<b>Current home location</b>	
Orange County	43 (96%)
Chapel Hill Township	40 (93%)
Hillsborough Township	1 (2%)
No specified	2 (5%)
Durham County	2 (4%)
<b>Living alone</b>	
Yes	8 (18%)
No	37 (82%)
<b>Marital status</b>	
Single	1 (2%)
Married	29 (64%)
Widowed	12 (27%)
Divorced	2 (4%)
Separated	1 (2%)
Never married	0 (0%)

while 5 reported there is no age requirement to receive CHCMOW. The majority of them reported CHCMOW serves homebound, disabled, unable to prepare meals, unable to purchase groceries and discharged from the hospital. Half of them reported CHCMOW serves a person both below and above poverty, and 4 seniors said CHCMOW only serves for people below poverty. The majority of them reported CHCMOW serves a people living in both rural and urban/suburban/city or town, and 1 senior answered CHCMOW only serves a person living in rural area. 7 out of 10 people reported CHCMOW serves a person with or without a vehicle, and 2 reported CHCMOW only serves a person without a vehicle. 3 seniors reported there is no minimum or maximum time commitment to receive CHCMOW service, while 4 people reported there is a time commitment, which the minimum is 6 months and the maximum is 2 years.

### *Health Condition*

Table 2 shows Asian seniors' self-reported health issues. 17 Asian seniors reported they don't have health issues, while 14 reported they have hypertension, and 10 have diabetes.

**Table 2. Self-reported Health Issues**

	n
Diabetes	10
Hypertension	14
Chronic kidney disease	2
Heart disease	5
Chewing difficulty	3
Swallowing difficulty	0
Food allergies or intolerance	3
Others	4
I do not have health issues	17

### *Nutrition Status*

Figure 1 shows Asian Seniors' nutritional risk score. 37 Asian seniors were screened for no or low nutritional risk, 4 screened for moderate nutritional risk, and 4 screened for high nutritional risk. The minimum score is 0, the maximum score is 10. The mean NSI score in Asian seniors is 1.6 compared to 3.02 in non-Asian seniors. By doing the linear regression, Asian seniors were found to have a statistically significant lower NSI score compared to non-Asian seniors ( $p=0.043$ ).

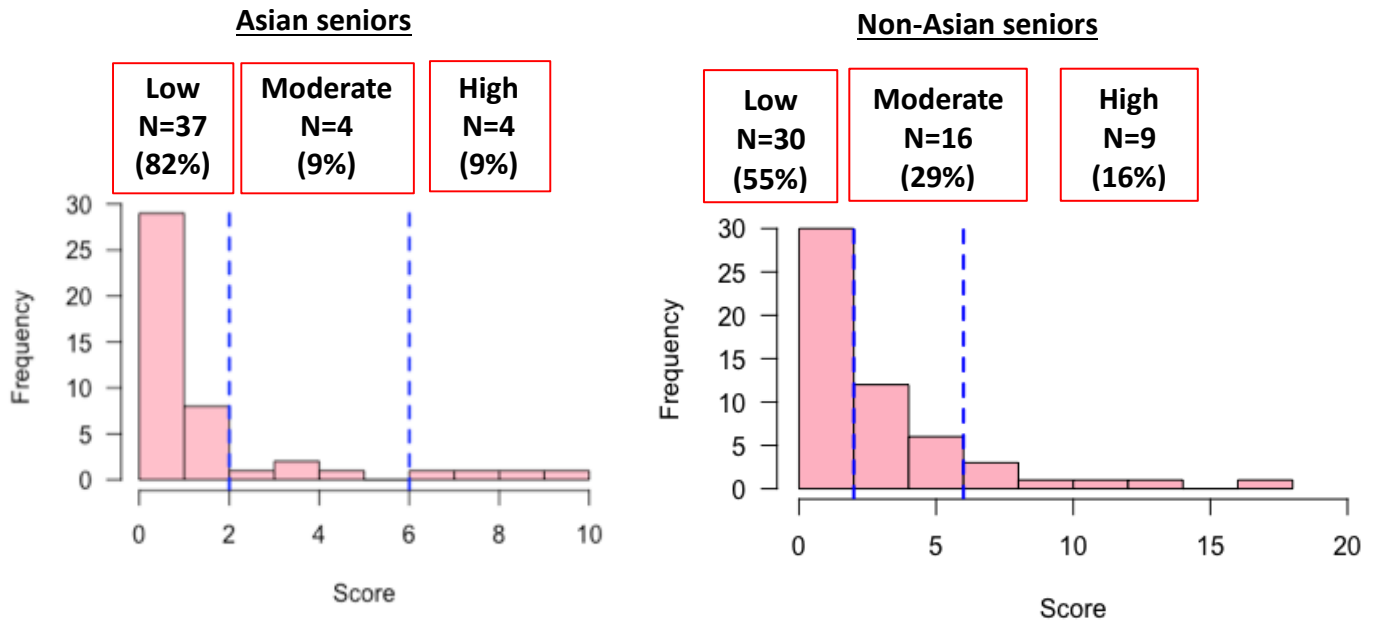
Table 3 shows the distribution of 10 nutritional risks from the NSI DETERMINE Checklist among three different age groups. 10 Asian seniors reported "I take 3 or more different prescribed or over-the-counter drugs a day." 8 reported "I eat alone most of the time," and among these Asian seniors, 6 are widowed, and 7 live alone. No Asian seniors answered yes to the statement "I am not always physically able to shop, cook and/or feed myself." There is no statistically significant association between the nutritional risks and age group since the p values from the Fisher's exact test are over 0.05.

Table 4 shows the association of NSI score over 3 between different variables. There is no statistically significant association of NSI score among these variables (age, gender,



education level, marital status, and living arrangement) since the p values from the Fisher's exact test are over 0.05.

**Figure 1. NSI Nutritional Risk Scores among Asian seniors and non-Asian seniors.**



**Table 3. Distribution of nutritional risks among three different age groups.**

NSI statements	Overalls* N (%)	Under age 65 (n)	Age 65-74 (n)	Over age 75 (n)
I have an illness or condition that made me change the kind and/or amount of food I eat.	3 (7%)	0	2	1
I eat fewer than 2 meals per day.	5 (11%)	1	3	0
I eat few fruits or vegetables or milk products.	4 (9%)	0	3	1
I have 3 or more drinks of beer, liquor or wine almost every day.	1 (2%)	0	1	0
I have tooth or mouth problems that make it hard for me to eat.	7 (16%)	0	5	2
I don't always have enough money to buy the food I need.	1 (2%)	0	0	1
I eat alone most of the time.	8 (18%)	0	5	3
I take 3 or more different prescribed or over-the-counter drugs a day.	10 (22%)	1	5	3
Without wanting to, I have lost or gained 10 pounds in the last 6 months.	3 (7%)	0	2	1
I am not always physically able to shop, cook and/or feed myself.	0 (0%)	0	0	0

\*All Asian seniors' responses were count including the one didn't report age.

**Table 4. Association of NSI Score over 3 among different variables.**

	<b>NSI over 3 (N=8)</b>
<b>Age</b>	
60-64	1
65-69	3
70-74	2
75-79	1
<b>Gender</b>	
Male	3
Female	5
<b>Education level</b>	
Less than high school graduate	1
High school graduate	2
Some college	2
Bachelor's degree	1
Graduate or professional degree	2
<b>Marital status</b>	
Married	5
Widowed	2
Divorced	1
<b>Living arrangement</b>	
Living alone	1
Living with others	7

Note: One Asian senior didn't report age.

### *Acceptance of CHCMOW*

19 out of 45 (42%) Asian seniors reported they would consider CHCMOW service if they needed food assistance in the future. The Asian seniors, who said they wouldn't consider CHCMOW, were asked to share the reasons. 9 Asian seniors said they are planning to go back to China, 4 said they live independently, 2 said they are not used to American food, and 1 said she receives strong family support.

### **Interview**

12 Asian seniors (AS#1-12) participated in individual in-depth interviews. Their average age is 79 years old from the youngest 63 to the oldest 88. 3 key informants (KI#1-3) were invited for key informant interviews. 2 key informants are the volunteers at Seymour Center for more than 10 years, and 1 is the staff working at Seymour Center for years. The key informant interviews were conducted first to collect Asian seniors' general information before starting interviewing Asian seniors. The interview contents were organized into six topics, including the Asian seniors' backgrounds, awareness of CHCMOW, perceptions of CHCMOW, health and nutrition status, aging experience and acceptance of CHCMOW.

### **THE ASIAN SENIORS' BACKGROUNDS**

The majority of Asian seniors are permanent residents, but they usually travel back and forth between China and the United States every 6 months. Others only stay here in the United States temporarily due to the type of visa (i.e., visitor visa) they hold. One of the key informants said...

***"...60% of Asian seniors are permanent residents who are green card holders, and about 40% are parents of visiting scholars, so they stay here only for months or half a year." --- KI #2***

Based on the key informants' reports, only one Asian family was known to receive CHCMOW before due to the need for food assistance. One key informant, who has been working at the center for several years, shared...

***"I only know one Chinese family [two siblings] received Chapel Hill-Carrboro Meals on Wheels before... The brother has an intellectual disability, so he can't live independently. They have difficulty in preparing the meal. Therefore, the sister came to us, and we recommended Meals on Wheels to her." --- KI #2***

Another key informant who volunteered at the center for more than 10 years, he said...

***"...not that I am aware of or heard of from the people I know [who have received CHCMOW before]...However, I don't know, and I am not sure about those who don't come to Seymour Center."--- KI #1***

Every day, about 30-40 Asian seniors actively come to the Seymour Center in the early morning from Monday to Friday to attend a variety of activities, such as ping pong, mahjong, singing, yoga, billiards or English class, etc. One key informant shared...

***"There might be hundreds of Asian seniors who have registered at the center...there are at least 30-40 Chinese seniors, who will come here for activities every day. If there is a special event, about 70-80 or even 100 Chinese seniors will show up." --- KI#2***

## **AWARENESS OF CHCMOW**

The majority of Asian seniors responded that they have never heard of CHCMOW, and only 4 out of 12 (33%) Asian seniors have heard of CHCMOW from either family or neighbors. One senior who has lived in the United States for 50 years responded...

***"I have heard of Meals on Wheels before because each state has this program...My dad, who lives in California, used the service before because he could not cook by himself after my mom passed away." --- AS #3***

The main reasons to explain why only few Asian seniors are aware of CHCMOW is because they don't need food assistance at this point, and CHCMOW has never outreached to this population in the past either. One key informant mentioned...

***"Asian seniors don't have this information because they live with their children most of the time, and their children will take care of them." --- KI #2***

## PERCEPTIONS OF CHCMOW

Those four Asian seniors who have heard of CHCMOW were asked to share their knowledge of its service. Their responses show that even though they have heard or seen CHCMOW before, they do not know clearly about its service. One of the seniors said...

***"...I know there is a similar service [home-delivered meal] here, but I don't know who they serve until you introduced it to me." --- AS#3***

Moreover, the seniors also do not know about the cost of the service. One senior who lives at the senior apartment stated...

***"I know some residents who live at another senior apartment receive CHCMOW...the meal charges the same fee as here [congregate meal] \$1." --- AS #9***

## HEALTH AND NUTRITION STATUS

To collect further information about Asian seniors' overall well-being, they were asked questions related to their health condition, meal preparation, food purchasing, and social contact.

- **Health condition**

The majority of the Asian seniors reported they are healthy; however, some of the Asian seniors mentioned about their health issues, such as tooth, knee and eye problems, which affect their mobility, eating, and vision function. One senior reported his physical activity has decreased since his knee started to pain, so he relies on medication to control the symptoms. He expressed...

***"Now, I need to spend more energy doing things I used to do, for example, playing ping pong...I feel I was healthier before my knee started to pain." --- AS #9***

The other senior also complains of her leg problem. She said she can't go to the doctor here because she doesn't have health insurance, so she is waiting to go back to China after a couple of months.

- **Meal preparation**

All Asian seniors reported either they are still physically able to prepare a meal, or they receive assistance from their children. They affirmed...

***"I live with my daughter and also my grandchildren...We cook together every day." --- AS #5***

For seniors living by themselves at the senior apartment, they also have no problem with meal preparation.

***"I stay here [Seymour Center] until 1 pm and go back to the [senior] apartment. In the afternoon, I will prepare some food..." --- AS #11***

A lot of Asian seniors living at the senior apartment will also go to their children's home every week, and their children will prepare food for them. One lady shared...

***"On Monday, we go to my daughter's place, and she will drive us back after dinner. Other than Monday, we stay at the senior apartment...My daughter will bring us grocery during the weekday." --- AS #11***

- **Food purchasing**

Even though the majority of these Asian seniors have no problem with preparing a meal, 9 out of 12 (75%) Asian seniors have difficulties in buying groceries because they don't know how to drive. Therefore, they rely on their children to bring them groceries, or they will go out with their children. One senior, who lives with her daughter, asserted...

***"My daughter can drive, and she is in charge of grocery shopping...Even though I can take the bus, I can't carry that much (groceries) and walk that long." --- AS #2***

For the Asian seniors living at the senior apartment, their children are also the main person who does grocery shopping. One senior shared...

***"My daughter will buy food for me every Saturday...Every Friday, she will call me if I need anything." --- AS #10***

- **Social contact**

Besides dining or staying at home, the majority of the Asian seniors come to the center for activities and the lunch program. One Asian senior who comes to the center everyday shared his feelings of the center...

***"There are a lot of social contacts in the center, and it is a very lively place compared to home." --- AS #3***

The other senior, who used to stay at home for half a year and experienced depression during that time, found going outdoors, such as coming to the center, has improved her mental health. She shared...

***"The benefit of coming here is, for example, at least you will learn different perspectives from other people, so you won't stay at home and do nothing...Wherever you go out to eat [like joining the lunch program], you will meet people but not isolate in the house." --- AS #8***

For the seniors who don't join any activities, they still find the center is an excellent place to meet people. One senior who has lived in Chapel Hill for 20 years, he reported...

***"I love to come here because my friends are here, and I can catch up on local news from them." ---AS #12***

## **AGING EXPERIENCE (LIFE CHALLENGES)**

A lot of the Asian seniors reported they have no worries at their current age and have a positive attitude about aging because some of them have independent financial support, or some have family accompany them. One senior shared...

***"I have nothing to worry about because I have money. I have two retirement funds." --- AS #1***

Another senior shared her perspective on her health and age...

***"To be honest, I don't feel like I am 71 years old, but I do feel it is unbelievable [that I am 71]. Mentally, I am probably only half of my age, like 30 something. Physically, I feel a little bit exhausted, for example, while climbing stairs. So, that's why I will come to the gym here to train my legs, knees and muscle." --- AS #3***

One senior shared her happiest thing now is having children around them.

***"The happiest thing is being together with my children." --- AS #5***

Nonetheless, these Asian seniors also experience some challenges while living in the United States. The key informants pointed out the common challenges that the Asian seniors have are language, family relationship, transportation and health care access. One key informant said...

***"...a lot of the Asian seniors can't receive social benefits even though they got the green card. It is very expensive for them to buy health insurance. So, they are very worried about getting sick and being a burden to their children...they live with their children closely, so if they have family issues with daughter or son in law, they are very sad...they want to let their children feel they are still useful so they will take care of grandchildren or cook...when they came to the United States at older age, they often describe themselves like a deaf and handicap, which means they don't understand in English or can't go anywhere because they don't know how to drive, so they feel very confined." ---KI #2***

These challenges were also addressed by the Asian seniors. 9 out of 12 Asian seniors reported they have language barriers of communicating in English. Although Seymour center provides an English class, the Asian seniors mentioned that it is hard for them to learn a new language at their age. One senior expressed...

***"...The English class is too challenging for me to learn." --- AS #4***

The other senior also shared her difficulty in reading Senior Times, which is the magazine published by Orange County Department on Aging to announce coming events and activities, because it only has the English version. Thus, that also limits their ability to be aware of events or services provided by the center.

***"...the Orange County's website only has English version (so are the Senior Times & its Facebook). When we use google translator, sometimes it does not sound right. We have to guess, and I, sometimes, will misunderstand the activity information." --- AS #8***

At least 5 Asian seniors reported they do not have health insurance in the United States, so they are worried if they get sick one day. One 74 years old lady said...

***“...the thing I worry about the most is getting sick. ...every time when I come here, I need to bring a lot of prescribed medicine in case I get sick here.” --- AS #5***

The other key informant added that...

***“...they [Asian seniors] don’t have good health insurance plans...Even though they have health insurance, only basic health insurance for older adults is not enough. It is very expensive for them to buy health insurance here [in the United States], and it does not cover too much” --- KI #3***

## ACCEPTANCE OF CHCMOW

The seniors were asked if they would consider CHCMOW when they needed for food assistance in the future. Over half of them said they would consider CHCMOW. Table 4 shows the acceptance of CHCMOW among the Asian seniors living with children and living at the senior apartments.

**Table 4. Acceptance of CHCMOW in the future among the Asian seniors living with children and living at the senior apartments.**

	Living at the senior apartments	Living with family
Would consider CHCMOW in the future	<p><b><i>“If there was no language barrier, I might think about to receive the CHCMOW service.” --- AS #6</i></b></p> <p><b><i>“I will stay here in the future so I would consider CHCMOW.” --- AS #9</i></b></p> <p><b><i>“I would think about CHCMOW service if I was not able to move or my daughter didn’t have time.” ---AS #10</i></b></p>	<p><b><i>“I would probably consider CHCMOW if I was not able to prepare food.” --- AS #1</i></b></p> <p><b><i>“Sure, I would consider CHCMOW service in the future.” --- AS #3</i></b></p> <p><b><i>“If I moved to the senior apartment and needed food assistance, I might consider CHCMOW service.” ---AS #4</i></b></p> <p><b><i>“I would think about their service if I needed food assistance in the future.” ---- AS #8</i></b></p>
Would not consider CHCMOW in the future	<p><b><i>“How would I consider the CHCMOW service? I don’t know how to communicate.” --- AS #6</i></b></p>	<p><b><i>“...it is impossible (to receive the CHCMOW service) because we cook at home. There must be some leftovers or food in the refrigerator that we can grab to eat. I don’t have the habit, or I am not used to order a meal delivery service.” ---AS #2</i></b></p>

		<p><b><i>“I prefer to prepare the meal by ourselves, which is more suitable for our taste.” --- AS #5</i></b></p> <p><b><i>“I won’t consider CHCMOW because, sometimes, my daughter will bring me out to eat, or she will prepare the food for me.” --- AS #7</i></b></p>
--	--	---

At the end of the interview, the key informants were asked if there is a need for Asian seniors to receive CHCMOW service, one of the key informants said...

***“I will say 90-95% it won’t happen to the Asian population [to receive MOW] because the situation is, if the Asian seniors cannot live independently by themselves, their children will bring them home. This is the Chinese tradition, in addition to mianzi <sup>1</sup>, this is our responsibility.” --- KI #1***

However, KI #1 continued to say...

***“Even though the older generation may not need CHCMOW at this point, there is still a need to let them or the next generations know about CHCMOW because they may age in here [Unites States] one day. It [CHCMOW] is part of the whole structure [social service system], so they still need to know about it to plan their future life.”***

The key informants claimed that there might be some challenges that CHCMOW may face while serving an Asian client...

***“The CHCMOW meal is more Western-style; they may not want to eat it...” ---KI #2***

In addition to the diet culture, language is another primary barrier for both CHCMOW and the Asian seniors. KI #2 also said...

***“When volunteers deliver the meal, they need to communicate with the Asian seniors. So, if the volunteer couldn’t speak Chinese, that would be an obstacle...”***

Another key informant said...

***“Language is one of the barriers, for example, seniors may need to call CHCMOW to make a cancellation if needed, but they don’t speak English at all!” --- KI #3***

Finally, the key informants were asked to provide suggestions for CHCHMOW to increase the awareness of its service among the Asian seniors, one of the key informants stated...

---

<sup>1</sup> A function of perceived social status and prestige within one’s social network.



***“...Chinese families do not have equal access to the aging service in Orange County. I feel we are not being used properly...We actually can share many local social resources like Meals on Wheels to the seniors’ children because their English are very well...I feel we should be more proactive in community outreach, for example, having a seminar that their children can join, too...It will be better to have Asian menu options...If Meals on Wheels has an Asian staff, that can solve the language barrier extremely...The senior center is a good channel to outreach a lot of Asian seniors, so are hospitals or some institutes, where have social workers. The Asian church is a good connection to outreach Asians as well.” ---KI #2***

## DISCUSSION

Asian American is often stereotyped as the “model minority” that they are the highest-income, best-educated racial group in the country, with few needs. However, the culturally unique challenges that Asian American older adults experience in accessing social services are often ignored and misunderstood. Moreover, according to the National Asian Pacific Center on Aging Listening Sessions Final Reports, the myth also renders their specific needs and characters invisible (Schafer, Chun, Lum, & National Asian Pacific Center on Aging, 2017). In this project, very few of the Asian seniors are aware of CHCMOW compared to non-Asian seniors. The following sections summarize the project results to explain why the Asian seniors have less opportunities to learn CHCMOW:

### Family Caregiving

Traditionally, Chinese society deems family the most important primary group to an individual (K.-K. Hwang, 1987). A typical Chinese family plays multiple roles in the economy, religion, education, and recreation, which can provide most of an individual’s needs (Hsu 1967; Lang 1946; Levy 1955). In the same Chinese social network, it is important to maintain *mianzi*, as also mentioned by one of the key informants in this project. *Mianzi*, face, is a function of perceived social status and prestige within one’s social network, and do “face work”, projection of self-image and impression management, in front of others (K. Hwang, 1987). Therefore, when these Asian seniors become older, their children must take a reciprocal responsibility for caring them.

Studies also show that for the older newcomers to the US, they are highly integrated into their families compared to the native-born elderly (Boyd, 1991; Burr & Mutchler, 1993; Cheung et al., 2015). This fact also reflects on this project’s finding that 82% of the Asian seniors live with their children’s family. Their children usually are the ones in charge of finance, communication, or decision making. The majority of Asian seniors live independently; however, their activities are limited to home and the senior center because the majority of them don’t know how to drive. Fortunately, their children will assist in driving and taking them out for grocery shopping or outdoor activities. For those living in the senior apartments, their children will also visit them weekly and bring groceries to them. With strong and close family support, that decreases their needs to receive additional food assistance from outside.

Other literature also mentions that family shame is another prevalent issue in Asian American caregiving that families may not reach out for help because it implies that they are not able to handle it themselves. Several seniors in this project expressed the same feeling that they don’t want to become their children’s burden. In addition, the key informants also shared that these Asian seniors, sometimes, are reluctant to let their children know about their concerns or needs. So, the seniors may do things based on their assumptions, which may not be beneficial to their family in the long term. For example, when they get sick, they may not mention about it, so they may miss the opportunity for early screening and receiving appropriate assistance. On the other hand, this project doesn’t collect information to show the feelings of caregiving from Asian seniors’ children. However, one key informant also mentioned that their children are also stressed in taking care of their parents because they

are also simultaneously caring for their own family. Therefore, there is a need for future studies to learn about their experience and find appropriate existing solutions such as CHCMOW or other social services to relieve their stressful duties.

### **Social contact**

Previous studies show that immigrated seniors who enjoyed being with other older adults were more satisfied with their lives in the United States because they can share their interests and join activities together (Treas & Mazumdar, 2002). This finding is also observed in this project. In addition to having family accompanied these Asian seniors most of the time, they come to Seymour Center almost every day to strengthen their bodies by a variety of activities like ping pong and billiards, etc., and also meet their friends. For the Asian seniors who don't participate in any activities, they still prefer to come to the center because it provides a lively atmosphere compared to their homes. Having friends from a similar background and speaking in the same language allows them to stay active and happy. However, they experience challenges in communicating with English speakers, which is one of their main barriers to live in the United States (see the next section).

### **Language Barrier**

In the United States, nearly 70% of Asians are foreign-born, and 31.5% of them speak English less than "very well (U.S. Census Bureau, 2019)." Limited English Proficiency restricts Asian American older adult's ability to access services (Schafer et al., 2017). In this project, the majority of Asian seniors are new immigrants, 89% of their primary language are Chinese, and 61% of them speak English less than very well. Communicating with English speakers is the primary barrier while they are at Seymour Center, which also limits their information access. The Senior Times is a quarterly magazine that advertises a variety of classes, programs, and events happening in Orange County. However, it only has an English version, as is also the case with the Orange County Department on Aging website and its Facebook. These Asian seniors experience challenges while trying to read and understand the information. In fact, Seymour Center provides a weekly English conversation class, and several Asian seniors actively attend to the class. However, some of the Asian seniors shared that they are not able to learn English well, especially at their age. In addition, the center has a part-time Chinese social worker working for 10 hours per week. Due to the limited working hours of that position, Asian seniors' issues which are needed promptly attention may not be able to solve immediately or efficiently. Fortunately, some Asian volunteers at the center speak English very well and are able to assist in translation or communication. Most of the Asian seniors' children also speak fluently English, so they may also be able to assist in communication.

### **Health and Nutrition Condition**

The NSI DETERMINE Checklist is a self-administered assessment tool to evaluate nutrition risk by asking ten statements related to dietary intake, medication use, food insecurity, weight loss, socialization, and ADLs, which is recommended to use by the Older Americans Act (OAA) Nutrition Program, including home delivery meals (Posner, Jette, Smith, & Miller, 1993; Sahyoun, Jacques, Dallal, & Russell, 1997). One of the Meals on Wheels services is to provide a friendly daily check-in along with meal delivery, and this daily social contact is

essential to ensure vulnerable seniors are safe at home. Therefore, the NSI is not only an awareness educational tool, as designed originally, but also enable elderly and their caregivers to recognize nutritional risk factors, including social contact and dining condition, to start early intervention.

There are not a lot of studies using the NSI DETERMINE checklist to assess Asian seniors' nutritional status, and it is uncertain whether the tool is applicable to an Asian population. However, a study found that 69.9% of community-dwelling older adults aged 55 and older in Singapore had no nutritional risk (Yap, Niti, & Ng, 2007). In this project, 82% of Asian seniors' nutrition conditions are within normal or no nutritional risk based on the NSI score. Furthermore, the top three reported individual nutrition risks in this project are similar to the previous study, too. Nevertheless, it is difficult to compare the previous study result to this project because of different population segments.

Beyond their current health and nutritional status, this project also found that several Asian seniors at the center don't have health insurance, so health care access becomes one of the biggest worries they have while living in the United States. They often choose not to go to doctors here; instead, they are waiting to go back to China for medical care. According to the census data, Asian seniors aged 65 years or over have the highest rate of no health insurance coverage status compared to other race/ethnic groups in the United States (U.S. Census Bureau, 2019). Other studies show that many immigrants, including those with legal documentation, are excluded from receiving federal benefits for five years or longer (Schafer et al., 2017). This observation brings up a health care access issue that requires future research to understand the Asian seniors' health care concerns.

### **Acceptance of CHCMOW**

Over half of the Asian seniors answered they would consider CHCMOW service in the future if they needed for food assistance in the future. This project also found that one of their concerns about receiving CHCMOW service is that they are not sure if they will live in the United States in the future or go back to China. A lot of seniors, even those green card holders, reported they are planning to move back to China because it is more convenient over there, which allows them to do things more independently.

### **RECOMMENDATIONS FOR FUTURE OUTREACH**

This project found that the need for these Asian seniors to receive CHCMOW is low at this point because the majority of them live independently and have strong family support. However, there is still a need to raise the awareness of CHCMOW by Asian seniors because every race group in Orange County should have equal access to know the available social services for older adults as other ethnic groups.

The key informants share the potential challenges that CHCMOW may face and also provide suggestions for future outreach planning:

#### **Challenge 1: The language barrier**

Communication may be the biggest challenge that both sides would face in different circumstances, for example, CHCMOW Operations Manager needs to conduct an in-home interview with seniors to determine their eligibility. Second, volunteer drivers need to

communicate with seniors as well to make sure recipients are doing well at home. Third, if an Asian senior needed to cancel a meal, they had to make a call to inform the CHCMOW office ahead; however, a lot of Asian seniors cannot speak English very well. So far, CHCMOW only has two Asian volunteers who are a couple and can speak Chinese, and they only volunteer once every week.

#### **Suggestions:**

##### **1. Recruit Chinese speaking staff, intern or volunteer.**

Having a contact person who can speak Chinese is the key strategy to solve the language challenge. Besides, the person can also assist in outreach event programming for the Asian population or play a role to receive the referred Asian seniors from a variety of health care channels such as hospitals, Senior Centers or the Asian church.

There are some ways to recruit Chinese speaking volunteers, including collaborating with Seymour Center, where it has some Chinese speaking volunteers, or UNC Asian American Students Association, where it may potentially have some Chinese speaking Asian American students.

##### **2. Reach out to Asian seniors' children.**

Most of the Asian seniors' children speak fluently English and also play the primary role in decision making at home. Therefore, for Asian seniors who cannot speak English, their children could be the ones to assist in communication. Moreover, for future outreach events, such as holding a seminar to introduce CHCMOW, it will be more influential if the Asian seniors' children could join, too, and it is essential to raise the awareness of social services such as CHCMOW to all generations as well.

#### **Challenge 2: Chinese diet culture**

Understanding the differences in diet cultures between Chinese and Western is important to overcome the challenge in cross-cultural communications and avoid unnecessary awkwardness while serving an Asian client. For a Chinese lunch, the staple food is mostly rice and noodles, while westerners prefer refined grains such as refined white flour (Li & Xiao, 2019). Moreover, the dish made in vegetables is their daily diet, and the Chinese take the plant as the main ingredient in the dish, while the westerners take vegetables as auxiliary diet and eat more meat (YANG & ZHANG, 2010). Western plant scholars found that Chinese eat 600 kinds of vegetables more than six times than Westerns. Besides, Chinese people prefer to eat cooked food, whereas westerners like raw vegetables, such as salad. In Chinese cooking methods, stir-frying, deep-frying, and quick frying are very common. In terms of dessert, Chinese people usually eat fresh fruit as dessert, while Western desserts are mostly cookies, cakes, or pies.

#### **Suggestion:**

##### **1. Include Chinese fusion menu options**

To provide a more cultural friendly meal, having a Chinese fusion meal option is important. For example, in the CHCMOW October menu, it has the entrée options such as Sweet & Sour Chicken, Teriyaki Chicken, Orange Chicken, and also rice which are more similar to Chinese diet culture.

**Strengths and limitations**

This project has some strengths including, first, this is the first research study targeting the growing Asian senior population in Chapel Hill. The local government departments and agencies may implicate the collected data to identify the unique health disparities and service utilization among this group in Orange County. Second, using both quantitative and qualitative research methods in this project not only allows to collect Asian seniors' general demographic and socioeconomic information, but it also provides valuable insights into this understudied population. Nevertheless, this study also has some limitations; for example, the results are lack of generalizability due to the convenience sample selection, which naturally excluded those Asian seniors who don't come to the center. Therefore, there is a need for future studies to understand home-based Asian seniors' health and nutrition status and also needs to receive CHCMOW.

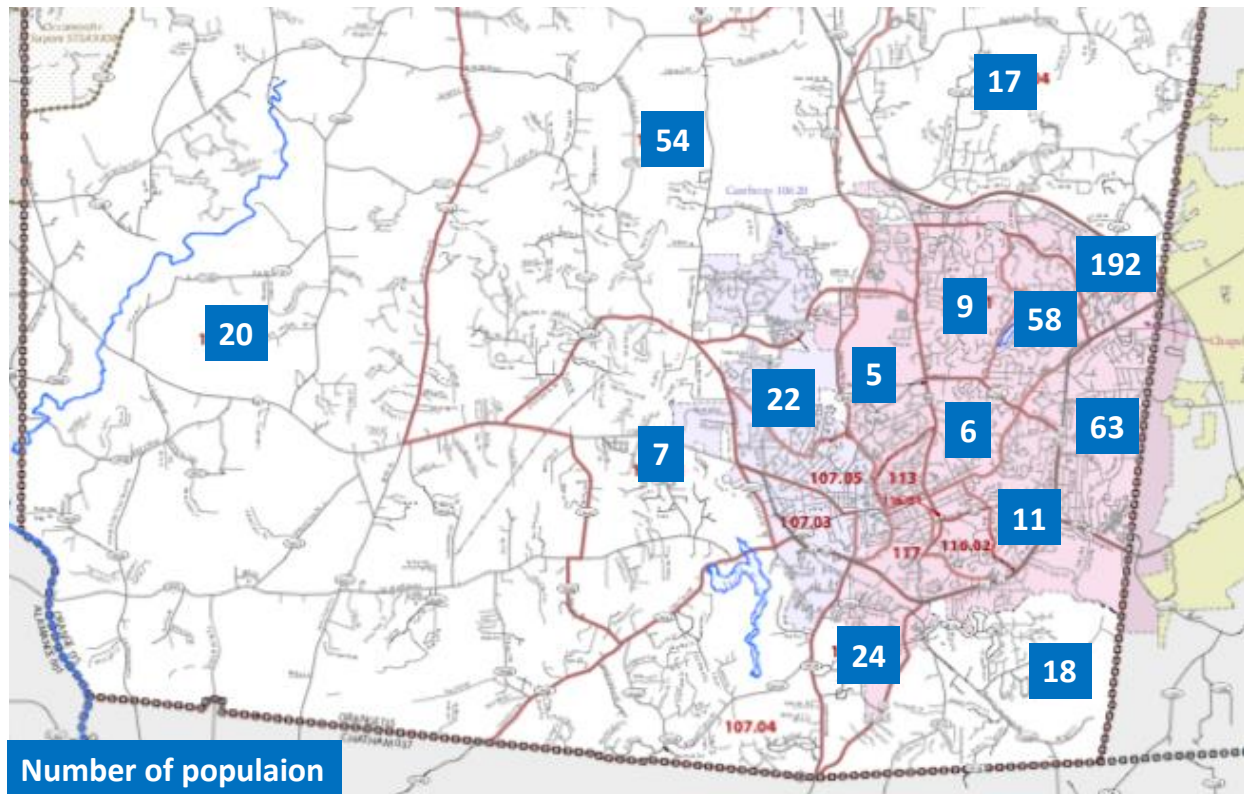
## CONCLUSION

The Asian seniors at Seymour Center have low awareness of CHCMOW, and their nutritional risk status are mostly within the normal or low range. They receive close social contact with family at home and friends at senior center, which strongly supports their overall well-beings and reduces their needs to receive additional food assistance, such as CHCMOW, at this point.

Meals on Wheels is one part of the social services for older adults in Orange County to assist the elderly who need food, nutrition and social support. Everyone, no matter their race, religion, gender, sexual orientation, disability, or national origin, should have equal access to know this service for their future aging planning. Therefore, there is a need to raise awareness of CHCMOW among the Asian seniors and also the next generations. Meanwhile, CHCMOW also needs to solve language barriers to provide outreach programs to this community in the future. CHCMOW can not only play a significant role in an older adult's overall well-being, but it may also ease a family's burden in taking care for older adults, in terms of providing a daily lunch and daily check-in.

Last but not least, future research on understanding Asian seniors' health care concerns, such as health insurance, and also family members' feelings on caregiving may be needed. Moreover, home-based Asian seniors' health and nutritional conditions also needs to be evaluated in the future in order to provide appropriate care for those hidden vulnerable older adults in Orange County.

## APPENDIX I. The Distribution of the Asian Population Aged 65 or Over in Chapel Hill



Source: ACS 2017 (5-Year Estimates), U.S. Census Bureau



## APPENDIX II (1/4). Chapel Hill-Carrboro Meals on Wheels Community Survey



### Chapel Hill-Carrboro Meals on Wheels Community Survey

Thank you for participating in our survey! Your answers will help us identify the need for Chapel Hill-Carrboro Meals on Wheels (CHCMOW) services in the community.

**1. Have you ever heard of CHCMOW?**

Yes (please answer Q2-8)

No (please skip Q2-8 and continue from Q9)

**2. Where did you hear about us? (check all that apply)**

Family

Friends

Neighbors

Social media

Meals on Wheels car

Senior Center

Doctors

Rehab

Hospital

Others (Please specify): \_\_\_\_\_

**Question 3 to 8 are asking for your perspectives about CHCMOW service:**

**3. Do you think there is an age requirement to receive CHCMOW service?**

Yes, what do you think is the minimum age? \_\_\_\_\_

No

**4. Which conditions do you think CHCMOW serves? (check all that apply)**

Homebound

Disabled

Unable to prepare meals

Unable to purchase groceries

Discharged from the hospital

Others (Please specify): \_\_\_\_\_

**5. What income level do you think CHCMOW serves?**

Below poverty level

Above poverty level

Both

 Next page...

## APPENDIX II (2/4). Chapel Hill-Carrboro Meals on Wheels Community Survey



**6. Which area do you think CHCMOW serves?**

- Rural
- Urban / suburban / city or town
- Both

**7. Who do you think CHCMOW serves?**

- A person with vehicle
- A person without vehicle
- Both

**8. Do you think there is a minimum or maximum time commitment to receive CHCMOW service?**

Yes

Minimum: \_\_\_\_\_ (days / months / years) ***Circle the time unit!***

Maximum: \_\_\_\_\_ (days / months / years) ***Circle the time unit!***

Both

No

**General Information**

**9. Do you have any of the following health issues? (check all that apply)**

- Diabetes
- Hypertension
- Chronic kidney disease
- Heart disease
- Chewing difficulty
- Swallowing difficulty
- Food allergies or intolerance (Please specify) \_\_\_\_\_
- Other (Please specify) \_\_\_\_\_
- I do not have health issues.

**10. What is your age group?**

- Under 55
- 55-59
- 60-64
- 65-69
- 70-74
- 75-79



Next page...

## APPENDIX II (3/4). Chapel Hill-Carrboro Meals on Wheels Community Survey



80-84

above 85

**11. What is your gender?**

Male

Female

Other (Please specify): \_\_\_\_\_

**12. Which of the following describe you? (check all that apply)**

Caucasian

African American

American Indian or Alaska Native

Asian

Native Hawaiian or Other Pacific Islander

Hispanic or Latino or Spanish Origin

Other (Please specify): \_\_\_\_\_

**13. What is your primary language at home?**

English

Other (Please specify): \_\_\_\_\_

How well do you speak English?

Very well

Fairly well

Only a little

Not at all

**14. What is your highest education level?**

Less than high school graduate

High school graduate or equivalent (e.g., GED)

Some college or associate's degree

Bachelor's degree

Graduate or professional degree

**15. What is your current marital status:**

Single

Married

Widowed

Divorced



Next page...

## APPENDIX II (4/4). Chapel Hill-Carrboro Meals on Wheels Community Survey



Separated  
Never married

### 16. Where is your current home location?

Orange County

Bingham Township  
Chapel Hill Township  
Cedar Grove Township  
Cheeks Township  
Eno Township  
Hillsborough Township  
Little River Township

Other County (Please specify): \_\_\_\_\_

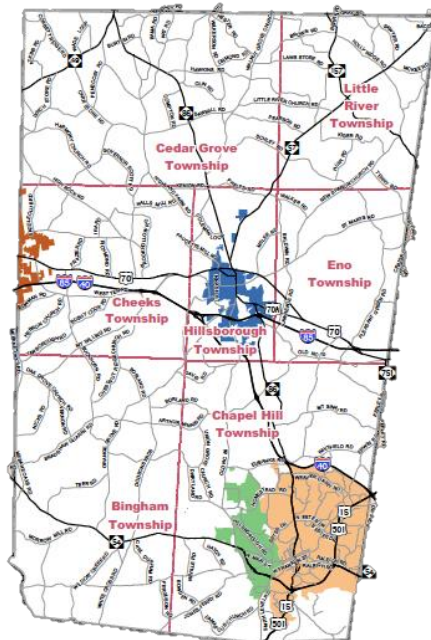
### 17. Do you live alone?

Yes

No. Who do you live with?

Family  
Relative  
Friend  
Caregiver (aid or nurse)  
Other (Please specify): \_\_\_\_\_

range County Townships



*Chapel Hill-Carrboro Meals on Wheels serves a hot balanced meal along with a quick, friendly check-in, Monday-Friday, to older adults, homebound adults, adults with disabilities, and those convalescing, who do not have access to, or the ability to prepare, a healthy meal.*

### 18. Would you consider CHCMOW service if you needed food assistance?

Yes

No. Why? \_\_\_\_\_

### 19. Would you like to receive further information about CHCMOW service?

Yes (Please provide your contact information):

Name: \_\_\_\_\_

Phone number: \_\_\_\_\_

Email: \_\_\_\_\_

No

*~ End of Survey. Thank you! ~*

## APPENDIX III. NSI DETERMINE Checklist

*The Warning Signs of poor nutritional health are often overlooked. Use this Checklist to find out if you or someone you know is at nutritional risk.*

Read the statements below. Circle the number in the “yes” column for those that apply to you or someone you know. For each “yes” answer, score the number in the box. Total your nutritional score.

# DETERMINE YOUR NUTRITIONAL HEALTH

	YES
I have an illness or condition that made me change the kind and/or amount of food I eat.	2
I eat fewer than 2 meals per day.	3
I eat few fruits or vegetables or milk products.	2
I have 3 or more drinks of beer, liquor or wine almost every day.	2
I have tooth or mouth problems that make it hard for me to eat.	2
I don't always have enough money to buy the food I need.	4
I eat alone most of the time.	1
I take 3 or more different prescribed or over-the-counter drugs a day.	1
Without wanting to, I have lost or gained 10 pounds in the last 6 months.	2
I am not always physically able to shop, cook and/or feed myself.	2
<b>TOTAL</b>	

**Total Your Nutritional Score. If it's –**

- 0-2**      **Good!** Recheck your nutritional score in 6 months.
- 3-5**      **You are at moderate nutritional risk.**  
See what can be done to improve your eating habits and lifestyle. Your office on aging, senior nutrition program, senior citizens center or health department can help. Recheck your nutritional score in 3 months.
- 6 or more**      **You are at high nutritional risk.**  
Bring this Checklist the next time you see your doctor, dietitian or other qualified health or social service professional. Talk with them about any problems you may have. Ask for help to improve your nutritional health.

Remember that Warning Signs suggest risk, but do not represent a diagnosis of any condition. Turn the page to learn more about the Warnings Signs of poor nutritional health.

*These materials are developed and distributed by the Nutrition Screening Initiative, a project of:*



AMERICAN ACADEMY  
OF FAMILY PHYSICIANS  
THE AMERICAN  
DIETETIC ASSOCIATION  
THE NATIONAL COUNCIL  
ON THE AGING, INC.



**The Nutrition Screening Initiative • 1010 Wisconsin Avenue, NW • Suite 800 • Washington, DC 20007**

The Nutrition Screening Initiative is funded in part by a grant from Ross Products Division of Abbott Laboratories, Inc.

## REFERENCES

- Blomberg, C., Chien, S., Ingawa, S., Nichols, M., Sharer, B., Hunter, M., ... Fraser, M. (2017). 2017-2022 Orange County Master Aging Plan. Retrieved from <https://www.aarp.org/content/dam/aarp/livable-communities/livable-documents/documents-2018/action-plans/orange-north-carolina-action-plan-2017.pdf>
- Boyd, M. (1991). Immigration and living arrangements: elderly women in Canada. *International Migration Review*, 25(1), 4. <https://doi.org/10.2307/2546232>
- Burr, J. A., & Mutchler, J. E. (1993). Nativity, acculturation, and economic status: explanations of Asian American living arrangements in later life. *Journal of Gerontology*, 48(2), S55-63. <https://doi.org/10.1093/geronj/48.2.s55>
- Cheung, H. C., Shen, A., Oo, S., Tilahun, H., Cohen, M. J., & Berkowitz, S. A. (2015). Food Insecurity and Body Mass Index: A Longitudinal Mixed Methods Study, Chelsea, Massachusetts, 2009-2013. *Preventing Chronic Disease*, 12, E125. <https://doi.org/10.5888/pcd12.150001>
- Fitzgerald, N., Hromi-Fiedler, A., Segura-Pérez, S., & Pérez-Escamilla, R. (2011). Food insecurity is related to increased risk of type 2 diabetes among Latinas. *Ethnicity & Disease*, 21(3), 328-334.
- Hanson, K. L., & Connor, L. M. (2014). Food insecurity and dietary quality in US adults and children: a systematic review. *The American Journal of Clinical Nutrition*, 100(2), 684-692. <https://doi.org/10.3945/ajcn.114.084525>
- Hwang, K. (1987). Face and Favor: The Chinese Power Game. *American Journal of Sociology*, 92(4), 944-974.
- Irving, S. M., Njai, R. S., & Siegel, P. Z. (2014). Food insecurity and self-reported hypertension among Hispanic, black, and white adults in 12 states, Behavioral Risk Factor Surveillance System, 2009. *Preventing Chronic Disease*, 11, E161. <https://doi.org/10.5888/pcd11.140190>
- Knight, T., & Ricciardelli, L. A. (2003). Successful aging: perceptions of adults aged between 70 and 101 years. *International Journal of Aging & Human Development*, 56(3), 223-245. <https://doi.org/10.2190/CG1A-4Y73-WEW8-44QY>
- Krueger, R. A., & Casey, M. A. (2015). *Focus Groups: A Practical Guide For Applied Research* (5th ed., p. 280). Thousand Oaks, California: Sage Publications, Inc.
- Leung, C. W., Epel, E. S., Willett, W. C., Rimm, E. B., & Laraia, B. A. (2015). Household food insecurity is positively associated with depression among low-income supplemental nutrition assistance program participants and income-eligible nonparticipants. *The Journal of Nutrition*, 145(3), 622-627. <https://doi.org/10.3945/jn.114.199414>
- Li, L., & Xiao, H. (2019). The Influence of Differences between Chinese and Western Diet Culture on International Business. *International Journal of Arts and Social Science*, 2(2).
- Lincoln, Y. S. (2016). *The Constructivist Credo*. Routledge. <https://doi.org/10.4324/9781315418810>
- Mangurian, C., Sreshta, N., & Seligman, H. (2013). Food insecurity among adults with severe mental illness. *Psychiatric Services*, 64(9), 931-932. <https://doi.org/10.1176/appi.ps.201300022>
- Matson, T. (2019, April 20). Chinese Food Culture – Understand your behavior when eating in China. Retrieved October 31, 2019, from <https://www.yumofchina.com/chinese-food-culture/>

- Meals on Wheels America. (n.d.). Meals on Wheels America. Retrieved September 18, 2019, from <https://www.mealsonwheelsamerica.org/learn-more/national>
- NC DHHS, Division of Aging and Adult Services. (2019). North Carolina is Aging! Retrieved September 19, 2019, from [https://files.nc.gov/ncdhhs/documents/files/NC%20State%20Aging%20Profile%202017\\_0.pdf](https://files.nc.gov/ncdhhs/documents/files/NC%20State%20Aging%20Profile%202017_0.pdf)
- Posner, B. M., Jette, A. M., Smith, K. W., & Miller, D. R. (1993). Nutrition and health risks in the elderly: the nutrition screening initiative. *American Journal of Public Health*, 83(7), 972–978. <https://doi.org/10.2105/ajph.83.7.972>
- Sahyoun, N. R., Jacques, P. F., Dallal, G. E., & Russell, R. M. (1997). Nutrition Screening Initiative Checklist may be a better awareness/educational tool than a screening one. *Journal of the American Dietetic Association*, 97(7), 760–764. [https://doi.org/10.1016/S0002-8223\(97\)00188-0](https://doi.org/10.1016/S0002-8223(97)00188-0)
- Schafer, D., Chun, H., Lum, W., & National Asian Pacific Center on Aging. (2017, February). The Emerging Needs of Asian American and Pacific Islander Older Adults. Retrieved October 29, 2019, from [https://www.napca.org/wp-content/uploads/2017/10/NAPCA-The-Emerging-Needs-of-AAPI-Older-Adults\\_Final-Report\\_Feb2017.pdf](https://www.napca.org/wp-content/uploads/2017/10/NAPCA-The-Emerging-Needs-of-AAPI-Older-Adults_Final-Report_Feb2017.pdf)
- Seligman, H. K., Bindman, A. B., Vittinghoff, E., Kanaya, A. M., & Kushel, M. B. (2007). Food insecurity is associated with diabetes mellitus: results from the National Health Examination and Nutrition Examination Survey (NHANES) 1999-2002. *Journal of General Internal Medicine*, 22(7), 1018–1023. <https://doi.org/10.1007/s11606-007-0192-6>
- Snider, J. T., Linthicum, M. T., Wu, Y., LaVallee, C., Lakdawalla, D. N., Hegazi, R., & Matarese, L. (2014). Economic burden of community-based disease-associated malnutrition in the United States. *Journal of Parenteral and Enteral Nutrition*, 38(2 Suppl), 77S–85S. <https://doi.org/10.1177/0148607114550000>
- Treas, J., & Mazumdar, S. (2002). Older people in America's immigrant families. *Journal of Aging Studies*, 16(3), 243–258. [https://doi.org/10.1016/S0890-4065\(02\)00048-8](https://doi.org/10.1016/S0890-4065(02)00048-8)
- United Nations, Department of Economic and Social Affairs, Population Division. (2019). World Population Prospects 2019: Highlights . Retrieved September 20, 2019, from [https://population.un.org/wpp/Publications/Files/WPP2019\\_Highlights.pdf](https://population.un.org/wpp/Publications/Files/WPP2019_Highlights.pdf)
- United States Census Bureau. (2018, October 1). An Aging Nation: Projected Number of Children and Older Adults. Retrieved September 21, 2019, from <https://www.census.gov/library/visualizations/2018/comm/historic-first.html>
- U.S. Census Bureau. (2012). 2007-2011 American Community Survey 5-Year Estimate. Retrieved September 21, 2019, from <https://factfinder.census.gov/faces/nav/jsf/pages/index.xhtml>
- U.S. Census Bureau. (2019). 2013-2017 American Community Survey 5-Year Estimates. Retrieved September 20, 2019, from <https://factfinder.census.gov/faces/nav/jsf/pages/index.xhtml>
- Wolff, B., Mahoney, F., Lohiniva, A. L., & Corkum, M. (2019). Collecting and analyzing qualitative data. In *The CDC field epidemiology manual* (pp. 213–228). Oxford University Press. <https://doi.org/10.1093/oso/9780190933692.003.0010>
- Wright, L., Vance, L., Sudduth, C., & Epps, J. B. (2015). The Impact of a Home-Delivered Meal Program on Nutritional Risk, Dietary Intake, Food Security, Loneliness, and Social Well-Being. *Journal of Nutrition in Gerontology and Geriatrics*, 34(2), 218–227.

<https://doi.org/10.1080/21551197.2015.1022681>

YANG, S., & ZHANG, Y. (2010). The Research of the Differences Between Chinese and Western Diet Cultures. *CROSS-CULTURAL COMMUNICATION*, 6(2), 75–83.

Yap, K. B., Niti, M., & Ng, T. P. (2007). Nutrition screening among community-dwelling older adults in Singapore. *Singapore Medical Journal*, 48(10), 911–916.